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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,558	12/07/2000	Timothy John Lindquist	169.1919	9526

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EXAMINER	
WARE, CICELY Q	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 06/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/730,558	LINDQUIST, TIMOTHY JOHN	
	Examiner	Art Unit	
	Cicely Ware	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *16, 17* is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *1*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

a. Pg. 13, line 9, applicant uses "summarise". Examiner suggests using "summarize" for clarification purposes.

b. Pg. 17, line 11, applicant uses the phrase "The Figure". Examiner suggests using "The figure" for clarification purposes.

Appropriate correction is required.

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 2-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 2 recites the phrase "substantially applied". "Substantially" is vague and indefinite because it fails to distinctly reference a particular boundary for the limitation in the claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 7 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Yeap et al. (US Patent 6,456,657).

(1) With regard to claim 1, Yeap et al. discloses (Fig. 4A and Fig. 4B) a method for performing an Inverse Discrete Wavelet Transform (IDWT) comprising, for a first sub-band level and a second sub-band level in an N level Discrete Wavelet Transform, the steps of: (i) inverse transforming, using filters having associated filter widths, data from associated sub-bands in the first sub-band level, to form processed data in a corresponding sub-band in the second sub-band level (col. 3, lines 66-67, col. 4, lines 1-5, 15-18, col. 6, lines 26-31); and (ii) inverse transforming, using second filters having the same corresponding associated filter widths, the processed data in conjunction with corresponding data from associated sub-bands in the second sub-band level; wherein steps (i) and (ii) are performed in a pipeline manner (col. 7, lines 17-31, col. 8, lines 5-17, col. 9, lines 27-38, col. 12, lines 59-65).

(2) With regard to claim 7, claim 7 inherits all the limitations of claim 1.

(3) With regard to claim 13, inherits all the limitations of claim 1. Yeap et al. further discloses a computer readable memory medium for storing a program for apparatus, which performs an Inverse Discrete Wavelet Transform (IDWT) (col. 11, lines 5-10).

7. Claim 15 is rejected under 35 U.S.C. 102(e) as being anticipated by Acharya et al. (US Patent 6,154,493).

With regard to claim 15, Acharya et al. discloses in (Fig. 4 and Fig. 6) a method for performing an IDWT in relation to an N level Discrete Wavelet Transform, said method comprising, for first sets of data points from associated sub-bands of a first sub-band level, and a second set of data points from a second sub-band level, said first set and said second set of data points each having first data dimensions (col. 4, lines 53-54, 58-60, col. 6, lines 17-19, 33-38, 49-52), steps of: (i) inverse transforming, using a first computational block having said first data dimensions, said first sets of data points to form a set of processed data points in a corresponding sub-band in the second sub-band level, said set of processed data points having said first data dimensions; and (ii) inverse transforming, using a second computational block having said first data dimensions, the set of processed data points in conjunction with a corresponding set of data points from associated sub-bands in the second sub-band level; wherein steps (i) and (ii) are performed in a pipeline manner thereby to form a set of output data points having said first data dimensions (col. 9, lines 7-65).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 2-4 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeap et al. (US Patent 6,456,657) as applied to claim 1 and 7 above, in view of Kim et al. (US Patent 6,539,412).

(1) With regard to claim 2, claim 2 inherits all the limitations of claim 1. However Yeap et al. does not disclose whereby said filters are used in relation to level N, and said second filters are time shared by all other N-1 pairs of consecutive levels N-1 and N-2, . . . 1 and 0, the second filters being applied to only a single pair of levels at a given time.

However Kim et al. discloses in (Fig. 5 and Fig. 6) disclose whereby said filters are used in relation to level N, and said second filters are time shared by all other N-1 pairs of consecutive levels N-1 and N-2, . . . 1 and 0, the second filters being applied to only a single pair of levels at a given time (abstract, col. 1, lines 33-40, col. 2, lines 5-13, col. 5, lines 3-5, 30-52).

Therefore it would have been obvious to one of ordinary skill in the art to modify Yeap et al. to incorporate whereby the filters are used in relation to level N, and said second filters are time shared by all other N-1 pairs of consecutive levels N-1 and N-2, . . . 1 and 0, the second filters being applied to only a single pair of levels at a given time

in order for each level to compute at a certain discrete time (Kim et al., col. 5, lines 25-26).

(2) With regard to claim 3, claim 3 inherits all the limitations of claim 2. Kim et al. further discloses in (Fig. 5 (24), Fig. 14 (241), Fig. 16 (241')) whereby time-sharing is performed using a time multiplexer, which multiplexes data from pairs of levels to the second filters (col. 2, lines 5-13, col. 5, lines 30-53, col. 9, lines 9-15, 32-48).

(3) With regard to claim 4, claim 4 inherits all the limitations of claim 2. Kim et al. further discloses in (Fig. 3 (18)) where data associated with a pair of sub-band levels associated with the second filters, is stored while the second filters are being applied to another pair of sub-band levels (col. 2, lines 16-18, 28-30).

(4) With regard to claim 8, claim 8 inherits all the limitations of claims 7 and 2 above.

(5) With regard to claim 9, claim 9 inherits all the limitations of claims 8 and 3 above.

(6) With regard to claim 10, claim 10 inherits all the limitations of claims 8 and 4 above.

10. Claim 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yeap et al. (US Patent 6,456,657) as applied to claim 1, in view of Hsu et al. (US Patent 6,389,176).

(1) With regard to claim 5, claim 5 inherits all the limitations of any one of claims

1 to 4. However Yeap et al. does not disclose wherein the filters and the second filters are N dimensional separable IDWT transformers.

However Hsu et al. discloses wherein the filters and the second filters are N dimensional separable IDWT transformers (col. 1, lines 53-57, 60-67, col. 2, lines 1-3, col. 6, lines 23-32).

Therefore it would have been obvious to one of ordinary skill in the art to modify Yeap et al. to incorporate wherein the filters and the second filters are N dimensional separable IDWT transformers in order to output perfect reconstructed versions of initially input data, the finite-length of the filters and a regularity requirement that the iterated low pass filters involve convergence to continuous functions (Hsu et al., col. 2, lines 5-8).

(2) With regard to claim 11, claim 11 inherits all the limitations of any one of claims 7 to 10 and 5 above.

11. Claims 6,12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tan et al. (US Patent 6,628,716) in further view of Yeap et al. (US Patent 6,456,657).

(1) With regard to claim 6, Tan et al. discloses in (Fig. 2) a method for performing an IDWT in relation to an N level Discrete Wavelet Transform, said method comprising steps of: (i) applying a first set of M x M filters to data from associated sub-bands in a first sub-band level, thereby to form M x M processed data points in a corresponding sub-band in a second sub-band level; N-1 corresponding sets of M x M filters, each

corresponding set being applied to M x M processed data points from a preceding level in conjunction with corresponding data from associated sub-bands in the succeeding sub-band level; thereby to form, in a pipeline manner, a set of M x M output data points (col. 2, lines 55-67, col. 3, lines 1-43).

However Tan et al. does not disclose a pipeline manner in respect to N-1 succeeding sub-band levels.

However Yeap et al. discloses in (Fig. 4A and Fig. 4B) disclose a pipeline manner in respect to N-1 succeeding sub-band levels.

Therefore it would have been obvious to one of ordinary skill in the art to modify Tan et al. to incorporate a pipeline manner in respect to N-1 succeeding sub-band levels in order to reduce the risk of corruption resulting from part of the signal being lost or corrupted during transmission and/or storage (Yeap et al., col. 3, lines 15-18).

(2) With regard to claim 12, claim 12 inherits all the limitations of claim 6.

(3) With regard to claim 14, claim 14 inherits all the limitations of claim 6. Tan et al. further discloses a computer readable memory medium for storing a program for apparatus, which performs an IDWT (col. 6, lines 24-27).

Allowable Subject Matter

12. Claims 16 and 17 allowed.

13. The following is a statement of reasons for the indication of allowable subject matter: The instant application discloses a method for performing an Inverse Discrete Wavelet Transform. Prior art references show similar methods but fail to teach "a first

plurality of parallel convolvers each having a plurality of output data channels, a second plurality of serial convolvers each receiving data from corresponding ones of said output data channels ", as in claims 16 and 17.

Conclusion

14. The prior art made record of and not relied upon is considered pertinent to applicant's disclosure:

a. Dent US Patent 6,219,375 discloses an apparatus for performing multiplication of a vector of multi-bit values by a matrix of multi-bit coefficients

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 703-305-8326. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
June 2, 2004

STEPHEN CHIN
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